

**Korea South-East Power Co. (KOSEP)**  
**small scale hydroelectric power plants project**  
(The Samchonpo Thermal Power Plant and  
Younghung Thermal Power plant small scale  
hydroelectric power plants construction project)

**Monitoring Report**

**From 01 Nov 2007 to 31 Dec 2008**

Dated: 13 April, 2009

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### **1. Title of the project activity:**

Korea South-East Power Co.(KOSEP) small scale hydroelectric power plants project (the Samchonpo Thermal Power Plant and Younghung Thermal Power plant small scale hydroelectric power plants construction project)

- Date of Registration of project: 23 March, 2007
- UNFCCC Registration Number: 0788

### **2. Introduction:**

This proposed project activity consists in 5,965 kW of facility capacity, and power generation of 38,155 MWh per year from the bundled two small-scale hydroelectric power plants – the Samchonpo and Younghung Thermal Power Plant small-scale hydroelectric power plants.

None of these two plants are part of a large project, according to Appendix C of the simplified modalities and procedures for small-scale CDM project activities.

KOSEP small-scale hydroelectric power plants project, which will substitute the fossil fuel fired plants by generating 38,155 MWh, has sought a 10-year renewable crediting period starting from 01 Nov., 2007.

### **3. General Description of the project:**

#### **3.1 Project Activity**

Small-scale hydroelectric power plants operated by KOSEP generate electricity. Hydro potential generate GHG emission-free electricity and displace an equivalent proportion of electricity using fossil fuel.

This project activity is a 5,965 KW hydro electric project. Thus this will approximately bring in 21,189 tons of CO<sub>2</sub> emission reduction annually for 10 years.

This proposed project bundled two small-scale hydroelectric power plants – the Samchonpo, and the Younghung Thermal Power Plant small-scale hydro power plant in accordance with Appendix C of the simplified modalities and procedures for small-scale CDM project activities.

The commercial operation of each power plant has been started as follows:

- The Samchonpo small-scale hydroelectric power plant: 31/10/2006
- The Younghung small-scale hydroelectric power plant: 31/10/2007

Starting date & Crediting Period: 01/11/2007

#### **3.2 Type and Category**

The project falls into ‘Renewable energy project’ of Type I of ‘Appendix B of the simplified modalities and procedures for small-scale CDM project activities’ in that KOSEP small-scale hydroelectric power plants project utilizes renewable energy source. Additionally, the project falls into ‘Electricity generation of a grid’ of category D, because electricity generated by renewable energy source is grid-connected.

Project type: Renewable energy projects  
 Category: D-Grid connected renewable electricity generation

### 3.3 Application of a monitoring methodology

Name: monitoring methodology for Project activity I.D “Grid connected renewable electricity generation”

Reference: Article 9 Type I.D. Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

### 3.4 Technical description of the project

Location of project activity: each power plant of this project is located at the following regions.

- The Samchonpo thermal power plant small-scale hydroelectric power plant: Goseong Gun, Gyeongsangnam-do
- The Younghung thermal power plant small-scale hydroelectric power plant: Ongjin Gun, Incheon metropolitan City

<Table1> Technology description of the small-scale hydroelectric power plants

Classification		The Samchonpo small-scale hydroelectric power plant	The Younghung small-scale hydroelectric power plant
Wheel	Type	Vertical/Horizontal Kaplan	Pit/Horizontal/Kaplan
	Output power	494.2 kW	1,000 kW
	Rotation	160 RPM	187.5 RPM
	Unit	6	3
Generator	Type	Three-phase induction (horizontal axis)	Synchronous (horizontal axis)
	Output power	1,000 kW	1,000 kW
	Unit	6	3
Transformer	Type	Mold type	Mold type
	capacity	7,000 kVA	4,000 kVA
	Volatage	3.3 kV / 22.9 kV	3.3 kV / 22.9 kV
	Connect-ion type	△-Y	△-Y
	Unit	1	1

#### 4. Monitoring methodology & Plan

The parameter to be monitored is:

Data Type	Data variable	Data Unit	Measured(m), Calculated(c), Estimated(e)	Recording frequency	Proportion of data to be monitored	The method of data achived	The term of data archived
Electricity supplied to the electricity grid	Electricity	kWh	M	Monthly	100%	Electronic	Two years beyond Crediting period

For a small scale CDM project activity the only set of data to be monitored is the net electricity output from the project.

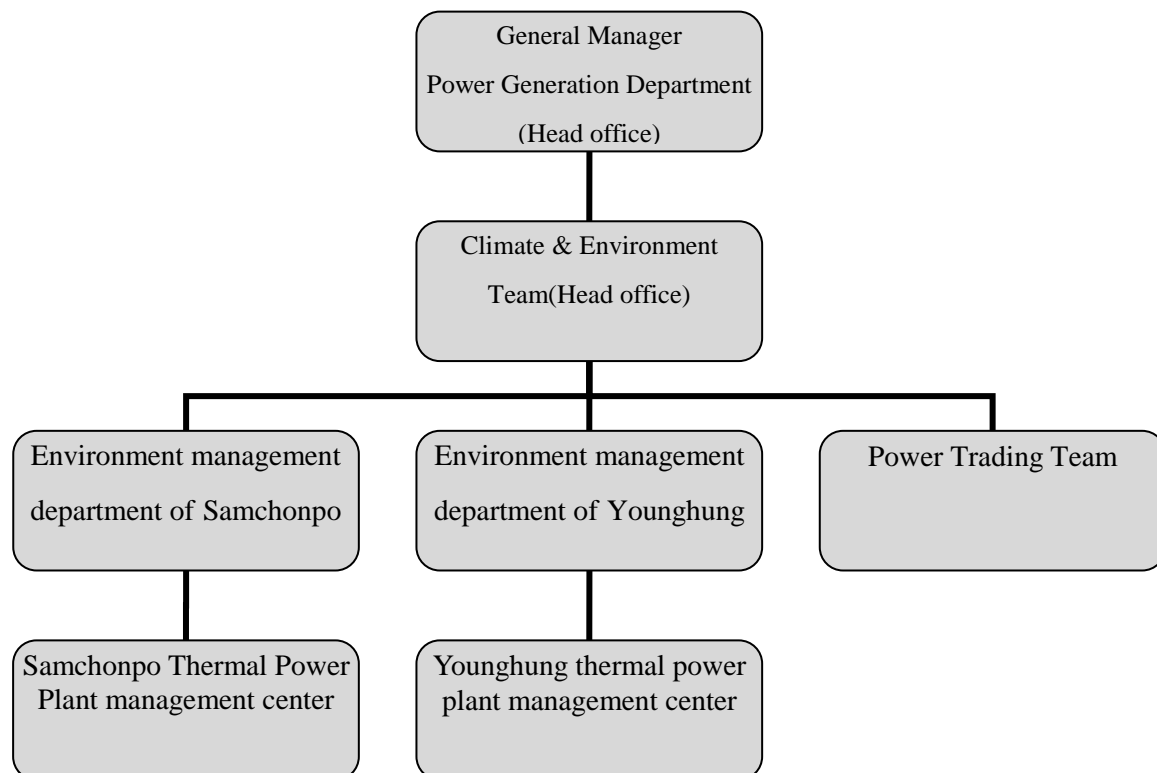
- Electricity meter to be monitored

Electricity meter has been set up transparently in accordance with “Law regarding measurement” and “Act on operation of electricity market” and measuring electricity is monitored in confirmation of Korea Power Exchange.

Electricity connected to the power-grid is measured by electricity meter installed for power trading system of Korea Power Exchange (KPX). And measured data are submitted to KPX for record-keeping everyday.

And the reporting system is as follows:

<Operational and management structure>



The responsible department and persons for the monitoring are as follows:

- Monitoring implementation: The Samchonpo Thermal Power Plant management center, the Younghung thermal Power Plant management center
- Report of monitoring results & monitoring data collection: The Environment management of Samchonpo, The Environment management department of Younghung
- Management of Monitoring(Monitoring report preparation & review): The Climate & Environment Team(Head office)
- Final approval of Monitoring Report: General Manager Power Generation Department(Head office)

## **5. Calculation of annual emission reductions**

To prove accuracy and consistency of monitored data, measured electricity data of Korea Power Exchange is compared with data measured by a generation meter of each facility. The energy business department of the headquarters collected and archived those data filed and given by each management center.

From doing such a thing, the below monitored results of electricity table is completed based on the amount of power transmission of Korea Power Exchange (KPX).

The calculation of annual emission reductions is completed according to the PDD.

OM is 0.7187 ton CO<sub>2</sub> eq/MWh and BM is 0.3920 ton CO<sub>2</sub> eq/MWh.

$$EF_y = (EF_{OM,y} + EF_{BM,y}) / 2$$

According to the above calculation, EF(Emission factor) is 0.5554 ton CO<sub>2</sub> eq/MWh.

Then, based on the following table that calculated the net emission reductions, the total CERs are 20,968 tons.

< Electricity Output & Emissions Reductions >

Section	Samchonpo	Younghung	Baseline Emission Factor (tCO <sub>2</sub> eq/MWh)	Net Emission Reductions (tCO <sub>2</sub> e)
	Electricity(MWh)	Electricity(MWh)		
Nov. 2007	2,254.458	-	0.5554	1,252.126
Dec.	2,167.277	-	0.5554	1,203.706
Jan. 2008	2,195.263	-	0.5554	1,219.249
Feb.	1,967.926	-	0.5554	1,092.986
Mar.	1,904.773	466.815	0.5554	1,317.180
Apr.	1,992.917	672.067	0.5554	1,480.132
May	1,875.086	1,051.245	0.5554	1,625.284
Jun.	2,051.378	918.428	0.5554	1,649.431
Jul.	2,177.053	1,081.146	0.5554	1,809.604
Aug.	2,241.857	1,078.929	0.5554	1,844.365
Sep.	2,118.192	1,045.458	0.5554	1,757.091
Oct.	2,180.648	1,111.196	0.5554	1,828.290
Nov.	2,182.323	524.822	0.5554	1,503.548
Dec.	1,965.684	528.757	0.5554	1,385.413
<b>Total</b>	<b>29,274.836</b>	<b>8,478.862</b>	0.5554	<b>20,968.404</b>

\*Electricity output of each facility is based on the data of Korea Power Exchange.